

# CONSTRUCTION ENGINEERING TECHNOLOGY (CNST)

## CNST-1281 Construction Engineering Orientation 3 Credits

Introduction to construction objectives and opportunities. Recognition of professional practices, current issues and developments in construction, including Green Building. Overview of construction project operations, trade journals, and associations.

*Lecture: 3 hours*

*Prerequisite(s): None.*

## CNST-1410 Architectural CAD I 3 Credits

Working drawing techniques of domestic structures using computer-aided drafting software. Floor plans, foundation plans, wall-sections, elevations, site plans and dimensioning techniques will be the core concepts.

*Lecture: 1 hour. Laboratory: 4 hours*

*Prerequisite(s): CNST-1731 Construction Print Reading; or departmental approval.*

## CNST-1510 Green Building & Sustainability I 3 Credits

Introduction to Green Building and sustainability issues. Study of current practices, systems, and materials used in the construction of Green buildings. Recognition of planning and design features that enhance the energy efficiency of a building and its environment. Overview of Green Building Rating Systems.

*Lecture: 3 hours*

*Prerequisite(s): None.*

## CNST-1660 Material Testing 2 Credits

Application of standard procedures for sampling and testing construction materials. Students will use laboratory equipment to test conditions of asphalt, concrete, and soil in relationship to stated material specifications, and then record testing results for analysis by supervisory personnel.

*Lecture: 1 hour. Laboratory: 2 hours*

*Prerequisite(s): MATH-0955 Beginning Algebra or appropriate score on Math Placement Test, and CNST-1731 Construction Print Reading, or concurrent enrollment.*

## CNST-1670 Highway Inspection 2 Credits

Introduces the concepts of field inspection and testing procedures; their applications to various construction activities, equipment, and products, and general work zone operations; interpretation of contract plans and specifications; project record keeping and reporting; and supervisory functions. Field trips may be required.

*Lecture: 1 hour. Laboratory: 2 hours*

*Prerequisite(s): CNST-1731 Construction Print Reading and MATH-0955 Beginning Algebra or appropriate score on Math Placement Test.*

## CNST-1731 Construction Print Reading 3 Credits

Overview of construction drawings for the major construction disciplines to understand presentation methods, interpretation, sequence of preparation, bid submittal processes, revision control, and code requirements. Commercial building, structural, and civil drawings utilized.

*Lecture: 3 hours*

*Prerequisite(s): None. CTAN Approved: Career Technical Assurance Guide CTCN001.*

## CNST-1740 Fundamentals of Geographic Information Science 3 Credits

[This course is cross-listed as GEOG-1740. Credit can only be earned once for either course.] Introduction to geographic information science with a focus on learning Geographic Information Systems (GIS) software.

Topics include map, interpretation, and analysis, coordinate systems, map projections, scales, topographic mapping, accuracy versus precision, spatial analysis techniques, types of thematic mapping, sources of data, basic database management, advantages and limitations of GIS, and an introduction to applications in engineering, engineering technology, and the sciences. Students are expected to have basic computer skills prior to taking this course.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): MATH-1410 Elementary Probability and Statistics I, or MATH-1470 Modern Mathematics for Business and Social Sciences I, or MATH-1530 College Algebra or higher.*

*OAN Approved: Transfer Assurance Guide OSS051.*

## CNST-1750 Construction Safety 3 Credits

The theories and principles of construction safety and health applied to real-world setting. Upon completion of course materials and required attendance hours, students receive their OSHA 30 certification.

*Lecture: 3 hours*

*Prerequisite(s): None. CTAN Approved: Career Technical Assurance Guide CTCN002.*

## CNST-1806 Material Testing 2 Credits

Application of standard procedures for sampling and testing construction materials. Students will use laboratory equipment to test conditions of asphalt, concrete, and soil in relationship to stated material specifications, and then record testing results for analysis by supervisory personnel.

*Lecture: 1 hour. Laboratory: 2 hours*

*Prerequisite(s): None.*

## CNST-2110 Basic Survey Practices 3 Credits

Study of construction site engineering using survey instruments for elevation contours, drainage, and grading for construction. Laser-levels, transits, and total stations will be utilized. Emphasis on instrument applications and field data recording.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): MATH-1540 Trigonometry and CNST-1731 Construction Print Reading; or departmental approval.*

*OAN Approved: Transfer Assurance Guide OET015.*

**CNST-2131 Construction Methods and Materials**

**3 Credits**

Study of common construction principles that affect jobsite performance, material selection and testing, and the general properties of traditional materials used. There will be focus on sustainability of materials and an introduction to non-traditional materials used in building assemblies.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): CNST-1731 Construction Print Reading; and MATH-0910 Basic Arithmetic and Pre-Algebra, or sufficient score on placement exam; or departmental approval.*

*OAN Approved: Transfer Assurance Guide OET016 and Career Technical Assurance Guide CTC0003.*

**CNST-2150 Building Enclosures**

**3 Credits**

Analysis of wall, roof, and floor assemblies for residential and light commercial construction with a concentration in thermal, air, and moisture control. Includes laboratory activities for constructing a building enclosure with non-traditional techniques and materials, including structural insulated panels, engineered lumber, fiber cement siding, composite decking, and insulated concrete forms.

*Lecture: 1 hour. Laboratory: 4 hours*

*Prerequisite(s): CNST-2131 Construction Methods, Materials and Equipment, or departmental approval.*

**CNST-2201 Introduction to Building Information Modeling**

**3 Credits**

Introduction into building information modeling (BIM). 3-dimensional software will be used to generate a building model and related drawings used in a set of contract documents. BIM software also used to determine material take-off quantities for to create estimates.

*Lecture: 1 hour. Laboratory: 4 hours*

*Prerequisite(s): CNST-1731 Construction Print Reading; or departmental approval.*

**CNST-2210 Mechanical and Electrical Systems**

**3 Credits**

Study of mechanical and electrical systems for building construction, water supply, waste and sanitation. Heat loss, heat gain and hydronic heating systems; forced air and solar heating systems used in buildings; electrical systems of power distribution and lighting for commercial buildings among the topics covered.

*Lecture: 3 hours*

*Prerequisite(s): CNST-2131, Construction Methods and Materials or concurrent enrollment; and eligibility for MATH-0955 Beginning Algebra; or departmental approval.*

**CNST-2250 Advanced Construction Print Reading**

**3 Credits**

Advanced print reading for commercial construction drawings. Interpreting drawing details in accordance to project manual, and material quantity take-off. Constructability review processes will be used to determine effective design and sustainability.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): CNST-1731 Construction Print Reading, or departmental approval.*

**CNST-2330 Construction Scheduling**

**3 Credits**

Capstone course that involves time management of construction activities. Use of Gantt charts, activity on arrow diagrams, PERT techniques, and critical path method. Computer scheduling software will be used throughout the course.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): CNST-2131 Construction Methods and Materials, or departmental approval.*

**CNST-2410 Principles of Structural Design**

**3 Credits**

Study of building design structural systems. Topics include steel beams, columns, base plates, fasteners and weldments. Emphasis on tension and compression for engineered building products and concrete structures.

*Lecture: 3 hours*

*Prerequisite(s): MET-1601 Technical Statics.*

**CNST-2510 Introduction to Asset Management**

**3 Credits**

Introduction to asset management with a focus on utility systems spread over a geographic region. Covers principles of cartography and methods for presenting geographic information. Coordinate systems, map projections, scale, topographic mapping, thematic mapping, spatial analysis methods, and mapping accuracy are expanded upon from introductory course. Use Geographic Information Systems (GIS) to analyze and model engineering systems. Probability models and ways to achieve levels of service within an overall system will be covered. Laboratory element with case studies incorporated.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): MET-2430 Engineering Probability and Statistics; and CNST-1740 Fundamentals of Geographic Information Science.*

**CNST-2631 Construction Management Systems**

**3 Credits**

Study of construction management practices including general contracting, subcontracting, project delivery, cost control, change processes and procurement. Introduction into lien implications, safety, quality and jobsite labor relations.

*Lecture: 3 hours*

*Prerequisite(s): CNST-2131 Construction Methods and Materials.*

**CNST-2830 Cooperative Field Experience**

**1-3 Credits**

Open to students eligible for the Cooperative Education Program. Employment in an approved training facility under College supervision. Requirement for one credit is 180 hours of approved work. Students may earn up to three credits in one semester. May be repeated for an accrued maximum of nine credits.

*Other Required Hours: 180 clock hours of approved work per credit hour.*

*Prerequisite(s): See campus COOP Advisor for the Cooperative Education Program application.*

**CNST-2990 Construction Estimating & Cost Analysis**

**3 Credits**

Capstone course in Construction Engineering Technology program. Includes construction cost estimates, cost forecasting, and cost reports for a construction project using computer software.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): CNST-2131 Construction Methods and Materials or concurrent enrollment.*